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EXAMINER

CABRERA, ZOILA E

ART UNIT	PAPER NUMBER
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2125

DATE MAILED: 10/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/727,544

Applicant(s)

TOMOYASU, MASAYUKI

Examiner

Zoila E. Cabrera

Art Unit

2125

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 27-35 is/are allowed.
- 6) ☒ Claim(s) 1-4, 6, 7, 9-12, 14, 15, 17-26, 36 and 37 is/are rejected.
- 7) ☒ Claim(s) 5, 8, 13 and 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/05/03; 03/19/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-4, 10-12, 18-26, 36 are rejected under 35 U.S.C. 102(e) as being anticipated by Marella (US 2003/0139838).

1. A process control system that controls processing executed on workpieces by, at least, one processing apparatus installed in each area in a factory, the processing results of which are predictable, comprising: at least one measuring apparatus that is installed for the corresponding area and executes a measuring operation on workpieces processed in the area (Page 5 [0044]-[0045]); a transfer apparatus provided for the corresponding area to transfer the workpieces among apparatuses which include said processing apparatus and said measuring apparatus in the area (Page 4 [0041]; Page 11, [0079]); and a control device installed for the corresponding area to control said processing apparatus, said measuring apparatus and said transfer apparatus in the area (Page 9, [0067]).

2. A process control system according to claim 1, wherein: said control device sets a

processing condition for said processing apparatus based upon the results of a measuring operation executed by said measuring apparatus on workpieces processed by said processing apparatus (Fig. 11, steps 124-130).

3. A process control system according to claim 2, wherein: said control device engages said transfer apparatus to transfer the workpiece at least having undergone the processing executed by said processing apparatus to said measuring apparatus (Page 4, [0041]), compares a measurement value indicating the results of the processing executed on the workpiece, which is obtained through a measuring operation executed by said measuring apparatus on the workpiece at least having undergone the processing with a target value for the processing results (Fig. 11, steps 124-126) and resets the processing condition for said processing apparatus in correspondence to an error in the measurement value relative to the target value if the error is judged to be equal to or greater than a predetermined value (Fig. 11, steps 124-130; Page 12, [0091]).

4. A process control system according to claim 2, wherein: said control device engages said transfer apparatus to transfer the workpiece at least having undergone the processing executed by said processing apparatus, to said measuring apparatus (Page 4, [0041]), compares a measurement value indicating the results of the processing executed on the workpiece, which is obtained through a measuring operation executed by said measuring apparatus on the workpiece at least having undergone the

processing with a target value for the processing results (Fig. 11, steps 124-126), observes the state of a fluctuation in an error in the measurement value relative to the target value so as to predict the tendency of the fluctuation, and resets the processing condition for said processing apparatus in correspondence to the tendency of the fluctuation error before the error exceeds a predetermined value (Page 12, [0091]).

10. A method of process control executed by a control device in each area in a process control system having installed in each area at least one processing apparatus, the processing results of which are predictable, at least one measuring apparatus that executes a measuring operation on a workpiece processed by said processing apparatus, a transfer apparatus that transfers the workpiece among apparatuses which include said processing apparatus and said measuring apparatus and said control device that controls said processing apparatus, said measuring apparatus and said transfer apparatus (Page 9 [0067]; Fig. 11), comprising: a step in which said measuring apparatus executes the measuring operation on a workpiece processed by said processing apparatus (Fig. 11, step 124); and a step in which a processing condition is set for said processing apparatus based upon the results of the measuring operation executed by said measuring apparatus (Fig. 11 steps 124-130).

Regarding claims 11-12, the same limitations applied to claims 3 and 4 above apply as well for claims 11-12.

Regarding claim 18, the same citations applied to claim 1 above apply as well for claim 18. Marella further discloses: A process control system that controls processing executed on a workpiece by at least one processing apparatus installed in each area in a factory and having; a processing chamber in which the processing is executed on the workpiece; a measuring unit that executes measurement processing on a workpiece before and after the processing is executed on the workpiece in said processing chamber, or either before or after the processing is executed on the workpiece in said processing chamber; and a means for in-apparatus transfer capable of transferring the workpiece at least between said processing chamber and said measuring unit (Page 2 [0015] Page 4, [0041; 0044]).

19. A process control system according to claim 18, wherein: said measuring apparatus functions as a reference apparatus for said measuring unit of said processing apparatus and checks on a regular basis whether or not there is any deviation of measurement results obtained by said measuring unit relative to measurement results obtained by said measuring apparatus or whether or not such a deviation is within an allowable range (Page 12, [0091]).

20. A process control system according to claim 18, wherein: said measuring apparatus is utilized to prepare measurement processing information required by said measuring unit of said processing apparatus to execute the measurement processing; and said measuring unit executes the measurement processing based upon said measurement

processing information (Page 5, [0044]-[0047]; Page 6, [0052]-[0055]).

21. A process control system according to claim 20, wherein: said measurement processing information includes, at least, coordinate information used to set coordinates specifying a measurement point on the workpiece (Page 7, [0059]).

22. A process control system according to claim 18, wherein: an object of measurement executed by said measuring apparatus and said measuring unit of said processing apparatus is the film thickness of a film formed on the workpiece (Page 3, [0033]).

23. A process control system according to claim 18, wherein: an object of measurement executed by said measuring apparatus and said measuring unit of said processing apparatus is a deposit present on the workpiece (Page 3, [0033]).

24. A process control system according to claim 18, wherein: an object of measurement executed by said measuring apparatus and said measuring unit of said processing apparatus is the width of a pattern formed on the workpiece (Page 3, [0033]).

25. A process control system according to claim 18, wherein: an object of measurement executed by said measuring apparatus and said measuring unit of said processing apparatus is defects present on the workpiece (Page 3, [0033]).

26. A process control system according to claim 18, wherein: an object of measurement executed by said measuring apparatus and said measuring unit of said processing apparatus is an overlay of patterns formed on the workpiece (Page 3, [0033]).

Regarding claim 36, the same citations applied to claim 1 above apply as well for this claim.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Marella (US 2003/0139838).

Regarding claim 37 Marella discloses, the same citations applied to claims 1, 10 and 18 above apply as well for claims 37. However, Marella does not specifically disclose the control device implements control to engage the measuring unit of another processing apparatus to execute the measuring processing on a workpiece undergoing processing by a given processing apparatus if the measuring unit of the given processing apparatus is not available for use. But Marella further discloses that the measurement devices may be configured differently or similarly to detect defects on one

specimen in parallel or in series. Therefore, it would have been obvious to a person of the ordinary skill in the art at the time the invention was made to have use another similar measurement device as taught by Marella, if a measuring unit of a given processing apparatus is not available for use because it would provide an improved system that would reduce the occurrence of defects in subsequent processing (Page 1, [0008]).

3. Claims 6, 7, 9, 14, 15 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marella (US 2003/0139838) in view of Ryskoski (US 6,721,616).

Marella discloses the limitations of claims 1 and 10 above but fails to disclose:
Regarding claims 6, 7, 9, 14, 15, and 17

6. A process control system according to claim 1, wherein: said control device ascertains a correlation between operation data and processing result data by executing a multivariate analysis based upon the operation data related to an operation of said processing apparatus and the processing result data indicating the results of the processing executed by said processing apparatus and obtains a predictive value that predicts the processing results based upon the correlation by using operation data obtained through processing executed on a workpiece other than the workpiece for which the correlation has been ascertained (Col. 6, lines 7-18 and lines 43-65; Col. 2, lines 55-60).

7. with the predictive value and regenerates the correlation if the error in the

measurement value relative to the predictive value is judged to be equal to or greater than a predetermined value (Col. 6, lines 7-18 and lines 43-65; Col. 2, lines 55-60).

9. A process control system according to claim 6, wherein: said multivariate analysis is executed by adopting a PLS method (Col. 4, lines 1; Col. 7, line 46).

The same citations applied to claims 6, 7 and 9 above apply as well for claims 14, 15 and 17.

Therefore, it would have been obvious to a person of the ordinary skill in the art at the time the invention was made to combine the teachings of Marella with the system of Riskoski because it would provide an improved system that would increase quality, reliability and throughput of integrated circuit devices .

Allowable Subject Matter

4. Claims 27-35 are allowed.

The following is an examiner's statement of reasons for allowance: The allowability of the claims resides, at least in part, that the closest prior art of record () does not disclose or suggest, alone or in combination the step of:

Regarding claim 27, a step in which a workpiece is transferred to said measuring apparatus by said transfer apparatus, undergoes the measurement processing executed by said measuring apparatus and the processing condition for said processing

Art Unit: 2125

apparatus is set based upon the results of the measurement processing while said measuring unit undergoes maintenance work, in combination with the other elements and features of the claimed invention.


5. Claims 5, 8, 13, and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning communication or earlier communication from the examiner should be directed to Zoila Cabrera, whose telephone number is (571) 272-3738. The examiner can normally be reached on M-F from 8:00 a.m. to 5:30 p.m. EST (every other Friday).

If attempts to reach the examiner by phone fail, the examiner's supervisor, Leo Picard, can be reached on (571) 272-3749. Additionally, the fax phones for Art Unit 2125 are (703) 872-9306. Any inquiry of a general nature or relating to the status of this application should be directed to the group receptionist at (703) 305-9600.



Zoila Cabrera
Patent Examiner
9/29/05